

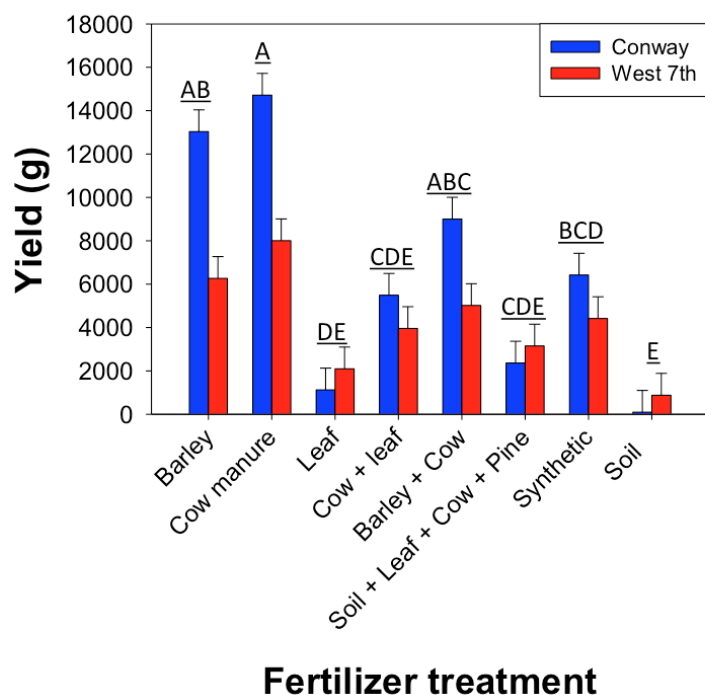
An experimental assessment of the benefits and costs of compost use in urban agriculture

Adam Kay, Chip Small, Kristen Bastug, Jake Anderson, Sam Harvey, Tanner Ruprect
Department of Biology, University of St Thomas

Rising food demand is placing unprecedented stresses on agricultural and natural systems. Approaches are needed to increase production on existing lands while reducing impacts on natural systems. Given the global rise in urbanization, urban agriculture will make important contributions toward these goals. However, research is urgently needed to improve production efficiency in urban environments and to engage citizens in urban agricultural efforts.

Although composting is a common feature of urban agriculture, we still have relatively little scientific information on how composting practices affect crop yield and nutrient pollution in urban settings. Quantifying the effect of these practices is a critical step in assessing urban agriculture's general impact on nutrient recycling and waste.

Our project "Growing Science" examines how fertilization strategies impact crop yield, crop nutrient content and nutrient run-off. Our sites are located at the West 7th and the Conway Community Centers in St. Paul, MN. We constructed 32 4m² raised beds at each site. The experiment consists of eight soil treatments (four plots for each treatment per site): (1) barley mash/wood chip compost, (2) cow manure compost, (3) leaf compost, (4) a manure/leaf compost blend, (5) a manure/barley compost blend, (6) a barley/cow/leaf blend, (7) a synthetic fertilizer, and (8) a negative control (with no added fertilizer). For each compost plot, 0.5 m³ of compost was mixed thoroughly with an equal amount of topsoil. For the synthetic fertilizer treatment, we regularly applied a 24N-8P-16K soluble fertilizer at a level recommended by the manufacturer.



Our preliminary analysis suggests that compost can lead to high crop yields, and the benefits of compost vary considerably among compost types (Figure 1). Most notably, three composts (barley, cow manure, and barley-manure mix) had higher yields than synthetic fertilizer. The barley compost, with no animal by-product, had yields that did not differ significantly from cow manure compost. Yard waste ("leaf") compost yielded only ~15% of the most productive composts.